International Journal of CIRCUIT THEORY and APPLICATIONS

Editor:

Professor J. O. Scanlan, Department of Electrical and Electronic Engineering, University College, Science Buildings, Upper Merrion Street, Dublin 2, Ireland.

Deputy Editor:

Dr. A. Csurgay, Research Institute for Telecommunications, CITAJOUR, 1391 Budapest 62, POB228, Hungary.

Editorial Board:

Professor K. M. ADAMS,
Department of Electrical Engineering,
University of Melbourne,
Parkville, Victoria 3052, Australia.

Dr. J. BACH ANDERSEN,
Aalborg University Center,
Badehusvej 1A, 9000 Aalborg, Denmark.

Professor V. BELEVITCH,
M.B.L.E. Research Laboratory,
Avenue Van Becelaere 2,
B-1170 Brussels, Belgium.

Professor G. BIORCI,
Istituto di Elettrotecnica,
Facolta di Ingegneria,
Viale Cambiaso 6, Genova 16145, Italy.

Professor P. R. BRYANT,
Department of Electrical Engineering,
University of Waterloo,
Waterloo, Ontario, Canada.

Professor H. J. CARLIN,
School of Electrical Engineering,
Cornell University,
Ithaca, New York 14850, U.S.A.

Professor S. C. DUTTA ROY,
Department of Electrical Engineering,
Indian Institute of Technology,
Hauz Khas, New Delhi 29, India.

Professor A. FETTWEIS,
Ruhr-Universität Bochum,
Lehrstuhl für Nachrichtentechnik,
463 Bochum,
Universitätsstrasse 150, Postfach 2148,
Federal Republic of Germany.

Professor K. GEHER,
Department of Electrical Engineering,
Polytechnical University of Budapest,
Budapest XI, Stoczek u.2, Hungary.

Dr. B. T. HENOCH,
Microwave Institute Foundation,
S-10044 Stockholm 70, Sweden.

Professor R. D. HORVAT,
Faculty of Electrical Engineering,
University of Belgrade,
Boulevar Revolucije 73,
Belgrade 11000, Yugoslavia.

Professor I. E. JEFIMOV,
Rector, Moskowski Elektrotekhnicheski Institut Sviazi,
Moscow E-24, Aviamotornaia 8, U.S.S.R.

Professor Dr.-ING M. KUMMER,
Technische Hochschule Ilmenau,
Sektion Informationstechnik und Theoretische Elektrotechnik,
DDR-63 Ilmenau, Postfach 327,
German Democratic Republic.

Professor D. G. LAMPARD,
Department of Electrical Engineering,
Monash University,
Clayton, Victoria 3168, Australia.

Professor J. NEIRYNCK,
École Polytechnique Fédérale de Lausanne,
Département d'Électricité,
16 Chemin de Bellerive,
CH-1007 Lausanne, Switzerland.

Dr. M. NOVAK,
Institute of Radio Engineering and Electronics,
Czechoslovak Academy of Sciences,
Lumumbova 1, Prague 8, Czechoslovakia.

Professor H. OZAKI,
Department of Electronic Engineering,
Osaka University,
Oaza Yamadaue Suita City,
Osaka-Fu, Japan.

Professor P. PENFIELD, Jr.,
Department of Electrical Engineering,
Massachusetts Institute of Technology,
Cambridge, Massachusetts 02139, U.S.A.

V. PORRA,
Department of Electrical Engineering,
Helsinki University of Technology,
Otaniemi 02150, Finland.

Dr. W. SARAGA,
Department of Electrical Engineering,
Imperial College of Science and Technology,
Exhibition Road,
London SW7 2BT, England.

J. K. SKWIRZYNSKI,
The Marconi Company Limited,
Great Baddow Laboratories,
Great Baddow,
Chelmsford, Essex, England.

Professor Dr. A. K. SMOLINSKI,
Politechnika Warszawska,
Instytut Podstaw Elektroniki,
Warszawa 10, Polna 54 m. 48, Poland.

Dr. H. WATANABE,
Computer Science Research Laboratory,
Central Research Laboratories,
Nippon Electric Company,
1753 Shimonumabe, Kawasaki 211, Japan.

JOHN WILEY & SONS
Chichester · New York · Brisbane · Toronto
A Wiley-Interscience Publication

Copyright © 1977 John Wiley & Sons Ltd. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical photocopying, recording or otherwise, without the prior written permission of the Copyright owner.

Printed in Great Britain by J. W. Arrowsmith Ltd., Bristol, England

CIRCUIT THEORY AND APPLICATIONS, VOL. 5, 435–436 (1977)

CONTENTS

Volume 5, Issue Nos. 1–4

International Journal of

CIRCUIT THEORY AND APPLICATIONS

Issue No. 1, January 1977

Editorial 2

S. K. Mitra, P. S. Kamat and D. C. Huey: Cascaded Lattice Realization of Digital Filters 3

C. Acar and M. Ghausi: Statistical Multiparameter Sensitivity Measure of Gain and Phase Functions 13

M. Chandrashekar and H. K. Kesavan: Graph-Theoretic State Models for the Piecewise Analysis of Large-scale Electrical Networks 23

L. O. Chua and N. N. Wang: On the Application of Degree Theory to the Analysis of Resistive Nonlinear Networks 35

A. G. Van Nie: Modulated Carriers in Nonlinear Systems 69

R. E. King and P. N. Paraskevopoulos: Digital Laguerre Filters 81

SHORT COMMUNICATIONS

M. F. Fahmy: On the Problem of Filters with Arbitrary Amplitude and Phase Constraints . . . 93

J. F. Kaiser: Comments on Maximally Flat Nonrecursive Digital Filters 103

BOOK REVIEWS 104

Issue No. 2, April 1977

L. T. Bruton, J. W. Haslett and R. C. Atkins: Nonideal Performance of Analogue Discrete Network 107

V. V. Bapeswara Rao, P. A. D. Jyothirao and V. G. K. Murti: Generation of Constituent Matrices 119

T. Trón: On State–space Synthesis of Reciprocal n-Ports 125

Tadeusz Morawski: A New Impedance-transformation Property and its Applications to Switching-diode Q-Factor Measurements 135

A. L. Sangiovanni-Vincentelli: A Graph Theoretical Interpretation of Nonsymmetric Permutation on Sparse Matrices 139

V. Kukk: An Improved Algorithm for Rational Approximation of Transfer Functions 149

M. Köksal and Y. Tokad: State–space Formulation of Linear Circuits Containing Periodically Operated Switches 155

B. D. Rakovich: Using Least-mean-square-approximation Technique in Filter Design 171

J. L. Wyatt and L. O. Chua: A Theory of Nonenergic N-Ports 208

F. S. Atiya and M. N. El-Shiekh: A Negative-impedance-converter Circuit for Higher Frequencies 209

BOOK REVIEW 215

Issue No. 3, July 1977

M. G. G. Naidu, P. S. Reddy and K. Thulasiraman: On the Number of Conductances Required for Realizing **Y** and **K** Matrices 219

G. A. Maria and M. M. Fahmy: Bounds for the Amplitude of Quantization Error in Forced 1st-order 2-dimensional Digital Filters 227

S. C. Dutta Roy and D. K. Bhargava: Sensitivity of Third- and Higher-order Filters 235

D. Hazony: Ideal Pulse Compression *via* Distributed Feedback 239

G. Mazzoni and A. Liberatore: Further Relationships Between Several Types of Multiparametric Sensitivity 245

M. S. Nakhla and F. H. Branin Jr: Determining the Periodic Response of Nonlinear Systems by a Gradient Method 255

J. Szczupak and S. K. Mitra: Recursive Digital Filters with Low Roundoff Noise 275

G. Mamola and M. Sannino: Analysis of Negative-resistance Oscillators with Piecewise Nonlinearity 287

M. R. Stojić and R. M. Stojić: Pole-zero Sensitivities of a Digital Filter Due to Parameter Quantization 299

E. Zeheb and E. Walach: 2-parameter Root-loci Concepts and Some Applications 305

S. K. Mitra and M. T. Ahmed: Synthesis of 2-variable Active RC Networks 317

Issue No. 4, October 1977

J. R. Jackson: Resonant Decoding for a Class of Nonsinusoidal Microwave Signals 331

M. F. Fahmy: Generalized Bessel Polynomials with Application to the Design of Bandpass Filters with Approximately Flat Group Delay Response 337

A. Fettweis: Symmetry Requirements for Multidimensional Digital Filters 343

U. Kumar and S. C. Dutta Roy: An Accurate Rational 2-port Model of a Class of Tapered Lossless and RC Lines 355

J. Gensel: On the Design of RC-active Follow-the-leader Feedback Filters 361

M. E. Mokari-Bolhassan and W. H. Ku: Tapered-magnitude Bandpass Distributed-network Transfer Functions 367

F. S. Atiya and M. M. Doss: A New Generalized Inverter Based on the Active Hybrid 379

C. Beccari: Double Predistortion for Electrical Filters 389

K. Meerkötter: Canonic Realization of Wave Digital Filters Involving Unit Elements 395

M. G. G. Naidu, P. S. Reddy and K. Thulasiraman: Continuously Equivalent Realizations of 3rd-order Paramount Matrices 403

R. Nouta: On the Efficient Wave Digital Filter Realization Using Programmable Hardware . . . 409

M. M. Milić: Some Topologico-dynamical Properties of Linear Passive Reciprocal Networks . . 417

BOOK REVIEWS 431

Table of Contents, Volume 5 435

Author Index 437

CIRCUIT THEORY AND APPLICATIONS, VOL. 5, 437–438 (1977)

AUTHOR INDEX, VOLUME 5

Acar, C. and Ghausi, M.: Statistical Multiparameter Sensitivity Measure of Gain and Phase Functions, 13
Ahmed, M. T.: see Mitra, S. K., 317
Atiya, F. S. and Doss, M. M.: A New Generalized Inverter Based on the Active Hybrid, 379
—— and El-Shiekh, M. N.: A Negative-impedance-converter Circuit for Higher Frequencies, 209
Atkins, R. C.: see Bruton, L. T., 107

Bapeswara Rao, V. V., Jyothirao, P. A. D. and Murti, C. G. K.: Generation of Constituent Matrices, 119
Beccari, C.: Double Predistortion for Electrical Filters, 389
Bhargava, D. K.: see Dutta Roy, S. C., 235
Branin Jr, F. H.: see Nakhla, M. S., 255
Bruton, L. T., Haslett, J. W. and Atkins, R. C.: Nonideal Performance of Analogue Discrete Network, 107

Chandrashekar, M. and Kesavan, H. K.: Graph-theoretic State Models for Piecewise Analysis of Large-scale Electrical Networks, 23
Chua, L. O.: see Wyatt, J. L., 208
—— and Wang, N. N.: On the Application of Degree Theory to the Analysis of Resistive Nonlinear Networks, 35

Doss, M. M.: see Atiya, F. S., 379
Dutta Roy, S. C.: see Kumar, U., 355
—— and Bhargava, D. K.: Sensitivity of Third- and Higher-order Filters, 235

El Shiekh, M. N.: see Atiya, F. S., 209

Fahmy, M. F.: On the Problem of Filters with Arbitrary Amplitude and Phase Constraints, 93; Generalized Bessel Polynomials with Application to the Design of Bandpass Filters with Approximately Flat Group Delay Response, 337
Fahmy, M. M.: see Maria, G. A., 227
Fettweis, A.: Symmetry Requirements for Multidimensional Digital Filters, 343

Gensel, J.: On the Design of RC-active Follow-the-leader Feedback Filters, 361
Ghausi, M.: see Acar, C., 13

Haslett, J. W.: see Bruton, L. T., 107
Hazony, D.: Ideal Pulse Compression via Distributed Feedback, 239
Huey, D. C.: see Mitra, S. K., 3

Jyothirao, P. A. D.: see Bapeswara Rao, V. V., 119

Kaiser, J. F.: Comments on Maximally Flat Nonrecursive Digital Filters, 103
Kamat, P. S.: see Mitra, S. K., 3
Kesavan, H. K.: see Chandrashekar, M., 23
King, R. E. and Paraskevopoulos, P. N.: Digital Laguerre Filters, 81
Köksal, M. and Tokad, Y.: State-space Formulation of Linear Circuits Containing Periodically Operated Switches, 155
Ku, W. H.: see Mokari-Bolhassan, M. E., 367
Kukk, V.: An Improved Algorithm for Rational Approximation of Transfer Functions, 149
Kumar, U. and Dutta Roy, S. C.: An Accurate Rational 2-port Model of a Class of Tapered Lossless and RC lines, 355

Liberatore, A.: see Mazzoni, G., 245

Mamola, G. and Sannino, M.: Analysis of Negative-resistance Oscillators with Piecewise Nonlinearity, 287
Maria, G. A. and Fahmy, M. M.: Bounds for the Amplitude of Quantization Error in Forced 1st-order 2-dimensional Digital Filters, 227
Mazzoni, G. and Liberatore, A.: Further Relationships Between Several Types of Multiparametric Sensitivity, 245
Meerkötter, K.: Canonic Realization of Wave Digital Filters Involving Unit Elements, 395
Milić, M. M.: Some Topologico-dynamical Properties of Linear Passive Reciprocal Networks, 417
Mitra, S. K.: see Szczupak, J., 275
—— and Ahmed, M. T.: Synthesis of 2-variable Active RC Networks, 317
——, Kamat, P. S. and Huey, D. C.: Cascaded Lattice Realization of Digital Filters, 3
Mokari-Bolhassan, M. E. and Ku, W. H.: Tapered-magnitude Bandpass Distributed-network Transfer Functions, 367
Morawski, T.: A New Impedance-transformation Property and its Applications to Switching-diode *Q*-factor Measurements, 135
Murti, V. G. K.: see Bapeswara Rao, V. V., 119

Naidu, M. G. G., Reddy, P. S. and Thulasiraman, K.: On the Number of Conductances Required for Realizing **Y** and **K** Matrices, 219; Continuously Equivalent Realizations of 3rd-order Paramount Matrices, 403
Nakhla, M. S. and Branin Jr, F. H.: Determining the Periodic Response of Nonlinear Systems by a Gradient Method, 255
Van Nie, A. G.: Modulated Carriers in Nonlinear Systems, 69
Nouta, R.: On the Efficient Wave Digital Filter Realization Using Programmable Hardware, 409

Paraskevopoulos, P. N.: see King, R. E., 81

Rakovich, B. D.: Using Least-mean-square-approximation Technique in Filter Design, 171
Reddy, P. S.: see Naidu, M. G. G., 219 and 403
Russell Jackson, J.: Resonant Decoding for a Class of Nonsinusoidal Microwave Signals, 331

Sangiovanni Vincentelli, A. L.: A Graph Theoretical Interpretation of Nonsymmetric Permutation on Sparse Matrices, 139
Sannino, M.: see Mamola, G., 287
Szczupak, J. and Mitra, S. K.: Recursive Digital Filters with Low Roundoff Noise, 275
Stojić, M. R. and Stojić, R. M.: Pole-zero Sensitivities of a Digital Filter Due to Parameter Quantization, 299
Stojić, R. M.: see Stojic, M. R., 299

Thulasiraman, K.: see Naidu, M. G. G., 219 and 403
Tokad, Y.: see Köksal, M., 155
Trón, T.: On State-space Synthesis of Reciprocal n-ports, 125

Walach, E.: see Zeheb, E., 305
Wang, N. N.: see Chua, L. O., 35
Wyatt, J. L. and Chua, L. O.: A Theory of Nonenergic N-ports, 208

Zeheb, E. and Walach, E.: 2-parameter Root-loci Concepts and Some Applications, 305